In the Claims:

The current status of all claims is listed below and supersedes all previous lists of claims.

Please cancel claims 8 and 22, amend claims 6, 9, and 12, and add new claims 25-34 as follows.

1-5. (canceled).

6. (currently amended) A process of preparing a pyrene actin composition comprising:

a) concentrating a pyrene actin composition; ~~and~~

b) mixing the concentrated pyrene actin composition with sucrose, a stabilizing agent, and a reducing agent, thereby generating a second pyrene actin composition; and

c) rapidly freezing the second pyrene actin composition.

7-8. (canceled).

9. (currently amended) The process of ~~claim 8~~ claim 6, further comprising:

d) lyophilizing the frozen second pyrene actin composition generated in step c.

10. (previously presented) The process of claim 6 wherein said reducing agent is dithiothreitol.

11. (previously presented) The process of claim 10, wherein the concentration of dithiothreitol is 10 mM.

12. (currently amended) The process of ~~claim 8~~ claim 6, wherein the second pyrene actin composition is rapidly frozen in liquid nitrogen or a dry ice ethanol bath.

13. (previously presented) The process of claim 6, wherein said stabilizing agent is dextran.

14. (previously presented) The process of claim 9, wherein the frozen second pyrene actin composition is lyophilized for 40 hours over a temperature from -40°C to 30°C.

15. (previously presented) The process of claim 6, wherein said pyrene actin is concentrated to 0.2 to 40 mg/ml.

16. (previously presented) The process of claim 6, wherein said pyrene actin is concentrated to greater than 10 mg/ml.

17. (previously presented) The process of claim 6 wherein said pyrene actin composition of step a) comprises ATP and $CaCl_2$.

18. (previously presented) The process of claim 6 wherein said sucrose is present in the second pyrene actin composition in amount of 5% w/v.

19. (previously presented) The process of claim 6 wherein said stabilizing agent is present in the second pyrene actin composition in an amount of 1% w/v.

20. (previously presented) The process of claim 9 further comprising:

e) resuspending the lyophilized and frozen second pyrene actin composition in a buffer comprising 5 mM Tris pH 8, 0.2 mM $CaCl_2$, and 0.2 mM ATP, thereby generating a resuspended pyrene actin composition; and

f) incubating said resuspended pyrene actin composition on ice.

21. (previously presented) The method of claim 20 wherein said resuspended pyrene actin composition is centrifuged.

22-24. (cancelled).

25. (new) A process of preparing a pyrene actin composition comprising:

a) concentrating a pyrene actin composition;

b) mixing the concentrated pyrene actin composition with stabilizing agents and a reducing agent, thereby generating a second pyrene actin composition;

c) rapidly freezing the second pyrene actin composition; and

d) lyophilizing the frozen second pyrene actin composition generated in step c.

26. (new) The process of claim 25 wherein said reducing agent is dithiothreitol.

27. (new) The process of claim 25 wherein said stabilizing agents are dextran and sucrose.

28. (new) The process of claim 25 further comprising:

e) resuspending the lyophilized and frozen second pyrene actin composition in a buffer comprising 5 mM Tris pH 8, 0.2 mM $CaCl_2$, and 0.2 mM ATP, thereby generating a resuspended pyrene actin composition; and

f) incubating said resuspended pyrene actin composition on ice.

29. (new) A method for producing a stabilized form of pyrene actin comprising:

concentrating pyrene actin to greater than 10 mg/ml and mixing with a reducing agent, and sucrose and dextran stabilizing agents to produce a concentrated pyrene actin;

rapidly freezing the concentrated pyrene actin to produce a frozen concentrated pyrene actin; and

lyophilizing the frozen concentrated pyrene actin with a gradient temperature profile from –40°C to +30°C to produce the stabilized form of pyrene actin, wherein the stabilized form of pyrene actin retains its ability to polymerize with the typical nucleation for more than 3 years when stored at 4°C.

30. (new) The process of claim 29 wherein the concentration of sucrose is 5% and the concentration of dextran is 1%.

31. (new) The process of claim 29 wherein the concentration of pyrene actin prior to freezing is greater than 20 mg/ml.

32. (new) The process of claim 29 wherein the reducing agent is dithiothreitol.

33. (new) The process of claim 29 wherein the lyophilized and frozen concentrated pyrene actin is rehydrated with 5 mM Tris-HCl, 0.2 mM adenosine triphosphate, 0.2 mM $CaCl_2$ and 10 mM dithiothreitol to create a solution of pyrene actin.

34. (new) The method of claim 33 whereby the solution of pyrene actin is polymerized by adding 50 mM KCl, 2 mM $MgCl_2$ and 1 mM adenosine triphosphate.